Barriers and solutions to participation in exercise for moderately disabled people with multiple sclerosis not currently exercising: a consensus development study using nominal group technique

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Abstract

Background: Multiple Sclerosis is a chronic, progressive neurological condition. The aim of this study was to explore consensus on the barriers and solutions to exercise for people with Multiple Sclerosis living in Scotland.

Method: 35 people with Multiple Sclerosis, not regularly exercising, were recruited and took part in 5 Nominal Group Technique groups throughout Scotland. Background information was collected on participants prior to each group. Participants individually and silently listed their barriers and solutions to participating in exercise. Group discussion then clarified, amended and merged ideas. Participants then ranked ideas by choosing 5 barriers and solutions to exercise participation. Data were analysed using descriptive statistics and by carrying out a thematic grouping.

Results: Consensus was that fatigue was a barrier to exercise participation. Other identified barriers were a lack of support and advice, the impairments arising from the condition and time. No single item achieved consensus for solutions but exercising with others, receiving support, having a positive attitude, finding time and minimising environmental barriers were all suggested as solutions to assist in exercise participation.

Conclusions: People with Multiple Sclerosis should be provided with information on how to manage their fatigue alongside any exercise prescription. Information and support should be given on how to personalise exercise to suit individual needs and abilities to overcome some of the barriers suggested within this study.

Key Words: Fatigue, support, self- management, impairments, environment, time.

Introduction

Multiple Sclerosis (MS) is a disease of the central nervous system resulting from an immune mediated inflammation and demyelination with subsequent axonal injury and loss [1]. The aetiology of MS is unknown but environmental and genetic factors play a role in its development [2]. Multiple Sclerosis leads to a wide variety of clinical features including cognitive, sensory, motor and psychological symptoms and is the most common disease of the central nervous system to cause permanent disability in young adults [3].

The lifespan for people with MS is 5-10 years shorter than the general population. There is a 2.5 times increased mortality risk for those with MS [4] due to lower levels of physical activity and resultant increased risk of cardiovascular disease [5,6]. The presence of cardiovascular comorbidities in people with MS has also been associated with increased disability progression [7]. Exercise can help manage the symptoms and it is also a modifiable risk factor that may reduce relapse or progression [8]. A Cochrane systematic review found exercise therapy to be beneficial for people with MS who were not experiencing an exacerbation of their condition [9]. They found strong evidence that exercise improved muscle power, exercise tolerance functions and mobility. There was moderate evidence that exercise improved mood. No evidence was found for exercise improving fatigue and no particular exercise programme was identified as being more effective than others. Importantly there were no harmful effects from exercise in any of the studies [9].

Activity guidelines have been produced for adults with MS which recommend that people with mild to moderate disability achieve at least 30 minutes of moderate intensity aerobic activity and strength training exercises for major muscle groups twice per week [10]. In spite of these recommendations people with MS have difficulty exercising on a regular basis.

These difficulties have been examined in studies exploring the perceptions and experiences of people with MS in relation to exercise [11-19]. Most of these studies were carried out on people with MS who were already exercising or taking part in a research study examining exercise. Previous research considering barriers and solutions to exercise for people with MS have generally used qualitative methods such as interviews or focus groups. Consensus development methods are ways of generating and bringing together the judgements of a group of people. Nominal group technique (NGT) [20] is a group consensus development method that has been used extensively in healthcare but not with people with MS [21-25]. It is useful in identifying problems, developing solutions and establishing priorities [26-30]. The aim of this study was to use NGT to identify the barriers and solutions to exercise for people with MS living in Scotland who were not currently exercising regularly.

Method

Ethical approval was granted from the Ethics Committee of the School of Health and Life Sciences, Glasgow Caledonian University. Participants were recruited from support groups of the MS Society, Scotland. The MS Society, Scotland sent emails to all support group co-ordinators with information about the study. Interested groups were asked to contact the research team and consent forms and participant information sheets were then forwarded. Each support group was asked to ensure they had 5-7 participants available to attend on the agreed day. Individual participants were recruited by the support group co-ordinator. Participants were eligible for inclusion in the study if they had a definite diagnosis of MS and were not currently exercising as defined by exercising less than 30 minutes every day. Participants were excluded if they were unable to write, had a visual impairment affecting their ability to write, had undergone a significant relapse in the past three months, were

currently involved in a drug trial or had significant comorbidities affecting their ability to exercise e.g. depression, cardiorespiratory problems.

Prior to the group meetings, through the group co-ordinator, participants were asked to sign a consent form and to complete a demographic questionnaire containing questions regarding age, employment, marital status, highest level of education, years since diagnosis and type of MS. Participants also completed the Multiple Sclerosis Impact Scale (MSIS-29) [31] which was used to gather information on each individual's physical and psychological limitations from the disease. Each meeting was facilitated by two researchers, lasted two hours and refreshments were available.

The Nominal Group Technique process as described by Delbecq and Van de Ven [20] was used which involved: silent generation of written ideas, a 'round robin' allowing participants to present their ideas, group discussion of the ideas generated and then ranking of ideas to obtain priorities.

One of the research team started the process by explaining the current evidence base on exercise and MS to the group. The researcher then posed the question 'what are the barriers to participation in exercise for people with MS'? Participants were given blank cards and were asked to silently write down their barriers to taking part in exercise on each card. There was no limit on the number of items which could be listed. The cards were then collected, and another member of the research team typed each of the items listed into a Microsoft Office®Excel version 2010 spreadsheet which was projected onto a wall/screen. The group then discussed the list and, if appropriate, related items were merged. In addition, any other ideas/items which emerged during the group discussion, and not on the list, were added. Once the list had been agreed by the group, a copy of the list was printed

for each participant on A4 paper. Participants were asked to select their top five items from the list and to rank those from 1 (most important) to 5 (least important). Ranked items were labelled as priorities [20].

The process was then repeated for the question 'what are the solutions to these barriers?' The group discussion was recorded using a digital recorder. The purpose of this was to provide an accurate record of the group discussion and to provide participant quotes to illustrate the study findings.

Data Analysis

The data were analysed in two stages. During stage one, for consensus to be achieved participant agreement had to occur both within and across the group [32]. Consensus within groups was achieved if at least 50% of each group's participants ranked an item. Consensus across groups was achieved if at least 50% of groups included the same item in their top five priorities. In groups where there were an odd number of participants the lower number was taken e.g. consensus was taken if at least 3 out of 7 people ranked the item.

Stage two was carried out to establish the amount and the strength of agreement [32]. The amount of agreement within the groups was calculated using frequency of ranking while the strength of agreement was calculated by summing the participant ranking. Stage one was used as the first step in identifying the top 5 priorities. Thereafter, stage two was used to order the priorities. If priorities had equal frequency scores, the summing of participant ranking was used to order the priorities. The priorities were also grouped thematically to allow the information to be presented under themes [32]. Quotes were obtained from digital recordings of the groups to illustrate the findings and bring the voice of the

participants into the results [33]. A Kurskal Wallis test was used to establish if any statistically significant difference existed ($p \leq 0.05$) in the MSIS-29 scores across the groups.

Results

Sample

A total of 35 people took part in 5 NGT groups (Table 1). All groups took place in accessible community settings. Groups were from different geographical areas in Scotland; from the Southwest to the North East. All groups took place in mainland towns and cities. Each group had 7 participants.

Table 1 Participant Demographics across all groups

Table 2 Summary of MSIS-29 group information

No statistically significant difference was found for the physical scores on the MSIS-29, but a statistically significant difference was found for the psychological scores ($p=0.03$). Overall, group 4 had the highest average MSIS -29 scores (mean: physical = 78 (95% CI 54.5-67.4), psychological = 30 (95% CI 19.6-25.5), total = 108) suggesting the disease had greater impact (Table 2).

Within Group Analysis

Following data analysis, the top five barriers and solutions to exercise participation arising from each NGT group were established (Tables 3 and 4). The priorities were listed using the participants' own words. Following data analysis, NGT groups 1, 2, 4, and 5 established 5

priority barriers and solutions to participating in exercise. NGT group 3 established only 3 barriers and 2 solutions.

Table 3 Group Priorities - Barriers to Exercise

Table 4 Group Priorities -of Solutions to Exercise

Across Group Analysis

The barriers and solutions were each grouped into relevant themes and these groupings were discussed and agreed by two researchers.

Across Group Consensus on Barriers to exercise for people with MS

Fatigue was ranked by Groups 3, 4 and 5 as their highest priority barrier to exercise. It was also ranked by group 2 as their 4th priority barrier to participation in exercise. Consensus was therefore achieved for fatigue being a barrier to participation in exercise. Table 5 outlines how other priorities were grouped, and the responses ranked. The other themes generated related to a lack of support and advice, impairments and symptoms, and time.

Table 5 Thematic Groupings across NGT Groups – Barriers to Exercise

Barriers

Fatigue

Four of the five groups identified fatigue as a priority. The presence of fatigue stopped participants from exercising.

> *"If you are tired you won't bother exercising, don't kid yourself…you will not do it. Exercising is not something you do when you are tired"* (Male 1, Group 1)

It also limited the amount of exercise a person could undertake within one session. Often the motivation to take part in exercise was present but fatigue prevented activity.

Time

Three of the five groups cited priorities relating to distinct aspects of time. Fatigue restricted opportunities to exercise by limiting when physical activity was possible within a day. Some people found it difficult to fit exercise into a time of day when they were less fatigued.

> *"That's the thing you say I'll go out and do such-and-such then I'll do a bit of exercise in the afternoon but by the afternoon you can't be bothered doing anything……just too tired".* (Male 2, Group 1)

Some participants were only able to exercise at specific times of the day and found that opportunities to attend classes did not fit with the times that suited them. Others found it difficult to find time, since day to day tasks took longer and left little time or energy for exercise.

> *"It's motivation to use your time for exercise because there so much else you could rather do…you can put it off very easily, so you have to be motivated to use your time".* (Female 1, Group 5)

Support and Advice

Three groups cited a lack of support and advice as a barrier to exercise. Support referred to receiving assistance to improve the safety of the exercise environment.

> *"I think it's about the safety of having a safe environment, for me if people would go with me I would like to go to the gym".* (Male 1, Group 1)

Some did not receive advice on what type of exercise and importantly how much exercise was appropriate. Some people avoided going into exercise situations where they needed to ask for help.

> *"If you need help that's a distinct put off. The fact that you know when I go there I'm going to have to get someone to help get me off it [gym equipment]….it puts you off".* (Male 2, Group 1)

Others could not take part because they needed assistance that was not available. There was a need for support and information to be provided to make the exercise safe and to aid in prescribing and modifying it when needed.

Many participants were not working and the cost implications of taking part in exercise became a barrier for many.

"We tried to organise a yoga group and we were given a price, but it was going to be 10 pounds an hour per head" (Female 1, Group 3).

Participants did not wish to pay the full cost of a session when they were only able to take part in half of it.

Impairments and Symptoms

Four of the five groups cited their impairments and symptoms e.g. pain and muscle stiffness posed a barrier to participation in exercise. There were also emotional consequences to the impairments and symptoms such as fear of falling and a loss of confidence in physical ability.

> *"I used to go swimming twice a week, but I've just got right out of it now ……. I actually lost my balance going into the shower... came out of the shower completely*

lost my balance, went to put my hand against the wall and the wall wasn't as close to me as I thought it was" (Female 1, Group 2).

Table 6 Thematic Groupings across NGT Groups - Solutions

Solutions

Across Group Consensus for Solutions to Exercise for people with MS

None of the data met stage one of the data analysis process therefore no consensus was achieved on identifying agreed solutions to assist participating in exercise for people with MS. The thematic groupings generated themes of 'exercise with similar others', 'specialist support', 'attitude of self and others', 'environment and accessibility' and 'finding time' (Table 6).

Exercise with Similar Others

Many participants stated that a solution to exercise was to be in a group situation with others of similar functional ability. Exercising with people without any physical impairment was not enjoyed by most participants.

"I wouldn't be put off in a group situation as long as people are similar, and you are not looking at people who are very fit with nothing wrong with them, especially if they are keep- fit fanatics". (Male 1, Group 1)

Specialist Support

All five groups cited priorities relating to the theme of specialist support which made it the most frequently cited solution to exercise. A participant from group 1 stated a need for

"Someone to be there and to know you are coming and to tailor things to you".(Female 1, Group 1)

The opportunities referred to a need for more specialised support within gyms, meeting the individual needs of people with functional impairment. For some, there was a need for someone who had knowledge of MS and how it might affect a person's ability to participate in exercise.

> *[A solution would be] If there is a class where the teacher is qualified and knows what the limitations of MS can be, and they can devise a course of exercises that is suitable for people"* (Female 1, Group 5)

Attitude of Self and Others

It was acknowledged that solutions to participation in exercise also related to the attitude of the person with MS. Group 2 identified 'mindfulness' as a solution to participation in exercise and the fostering of a positive attitude was discussed at length within this group. A participant in group 2 explained this by saying "*Mindfulness, don't think back and not too far ahead, just on the moment"*. (Female 2, Group 2)

Acceptance of 'how things are' was an important feature of this theme and how solutions can be addressing psychological issues.

> *"Part of my MS is weighing myself up mentally, it's a lot to do with what's going on in my head as it is to do with my limitations. So, the solutions must be in my head too".* (Female 1, Group 2)

Being able to accept current physical limitations was a solution suggested within this theme. People often compared their current physical limitations with previous ability which was viewed by some as unhelpful behaviour.

> *"For me as an ex- athlete it's now trying to do exercise/ sport when you are sitting down…. That's mentally quite a hard one to deal with… right can't do that one now... expletive, expletive, expletive but then it's trying to tell yourself, right in reality that's all you can do so forget about what you used to do. Be glad you did it.* (Male 1, Group 4)

Environment and Improving Accessibility

Some of the priorities identified within the theme of environment and accessibility related to accessibility of exercise situations.

> *"I wouldn't even try a rowing machine because it's too low unless there was a grab rail next to it and I could haul myself up"*. (Male 2, Group 1)

Some found that exercise environments were too hot and a solution to help exercise participation was to make them cooler. Some participants found the distances and open spaces difficult so for example walking from the swimming pool to the changing room was stated as a challenging task. Participants were unsure if they would manage to access the facility and wanted a full list of venues that were accessible.

Finding Time

Two groups cited a solution was making exercise a priority. It was acknowledged that everyday tasks took longer leaving less time and energy to exercise. Fatigue was linked with this theme leading so time was cited as both a barrier and solution to exercise. A participant

in group 2 illustrated this by stating: *"Things take you so much longer to do so you have less time to exercise".* (Female 1, Group 2)

Discussion

Fatigue was the only barrier to exercise which reached consensus. Although fatigue is often an inevitable consequence of the disease, fatigue management programmes are available for people with MS [34,35]. Interventions to help in the management of fatigue in people with MS include mindfulness, exercise, cognitive behavioural techniques and information on managing other factors such as overexertion, heat, stress and time of day [8]. Assessment of fatigue should be part of any pre-exercise or physical assessment with those affected provided with information on how to manage this often-disabling impairment. When everyday tasks took longer it was often difficult to find the time to exercise. Setting a regular time to exercise could help a person with MS integrate exercise more effectively with work and home life. A discussion around 'finding time' could be part of a discussion with a healthcare or exercise professional.

A lack of support and advice with exercise was another barrier cited in many of the NGT groups but did not reach consensus. Participants discussed issues relating to exercising with others of similar ability as one solution to this. Exercising in a group setting may be one method of providing support where the exercise being prescribed can be adjusted by the exercise leader. Exercising with another person or 'exercise buddy' could also provide support to a person. Previous research identified that introducing exercise with participant control over the amount of exercise activity alongside providing support, advice and encouragement from a physiotherapist were facilitators of long term exercise adherence for people with MS [36].

Participants wished for the individual providing the information or taking the class to have specialist knowledge of MS and the symptoms with which people may present. Participants generally wanted more information and support on how to personalise the exercise to suit their often-changing needs. Participants also wished for more information on suitable local exercise opportunities, not home-based exercise. Support was also requested to help deal with the emotional consequence of exercise to assist with setting exercise expectations. Advice on exercise needs to be available from different health care and exercise professionals as well as in different formats e.g. written and online. Charities and support groups for people with MS could play a significant role in this.

Two prominent issues arising from the barrier, 'impairments and symptoms' related to falls risk and continence issues. There is a high prevalence of falls in people with MS therefore assessment of falls risk should be undertaken prior to commencing an exercise programme [37].

Needing to go to the toilet during exercise and requiring help to do so was a barrier that was cited by two groups. There is a high prevalence of lower urinary tract disorder and bowel dysfunction in people with MS [38,39]. Pre-exercise screening could include a discussion on bladder and bowel issues and current strategies or coping mechanisms being used. Sessions could include a toileting break and toileting facilities should be situated close to where the person is exercising.

Self-efficacy is the one factor that has consistently been correlated with physical activity in healthy adults [40]. The solutions stated within the present study i.e. exercising with similar others, being able to access specialist support in different exercise settings and ensuring the exercise is suitable for people with a disability could assist in improving the self-efficacy of

people with MS in relation to exercise. Mastery experience is the most influential source of information that contributes to self-efficacy [40]. The provision of exercise tasks appropriate for the person with MS for their physical and functional ability is one way of ensuring a good mastery experience. Part of this mastery is getting to and from the environment where the exercise is taking place in a safe manner.

The study sample includes the recommended number of participants for an NGT group however numbers are relatively small. Thought should be given to the context of the study when considering the findings. The NGT groups took place in urban areas of Scotland with most participants over 51 years of age, retired or medically retired, diagnosed with the condition more than 10 years ago and had either relapsing remitting or secondary progressive MS. All were attending a support group. Similarly, the MSIS-29 physical scores ranged from 55.3-78.5 indicating a wide range of physical ability between the groups. This variability in physical MSIS-29 scores may have impacted on the lack of consensus for solutions to participating in exercise. It may also have influenced the nature of the barriers and solutions identified as it is currently unknown if the barriers to exercise for people with MS are similar for differing levels of disability. Group 4 recorded higher physical and psychological MSIS-29 scores. This may have resulted in the barriers identified for this group (Table 3) including more priorities relating to higher levels of fatigue. Future research could include a larger sample size, explore the views of younger people with MS, those more recently diagnosed with the condition and still working and for differing levels of disability. Although cognitive problems are common in MS no cognitive screening took place [41]. No indications of major cognitive impairments were however observed during the consent and NGT process.

Conclusion

Further research is warranted before the findings of this study can be applied to practice, however this study is novel in that it explored barriers and solutions to exercise for people with MS not currently exercising. Due to the heterogeneity of MS symptoms, more exercise opportunities are required where people with MS can receive personalised support and advice. This is the first time NGT has been used with people with MS and is recommended for use in future studies.

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Declaration of Interest

The authors report no conflict of interest

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Tables

Table 1: Participant Demographics across all groups

Demographic	Range/Category	Number of Participants	% of Participants
Age range in years	18-35	1	3%
	36-50	7	20%
	51-65	17	48%
	Over 66	10	29%
Gender	Male	11	31%
	Female	24	69%
Employment Status	Working full-time	1	3%
	Working part-time	4	11%
	Unemployed	1	3%
	Retired	13	37%
	Medically retired	16	46%
Marital Status	Married/cohabiting	21	62%
	Single	12	34%
	Widowed	1	3%
Highest Level of Education	University	15	43%
	School	13	37%
	College	7	20%
Years since diagnosis	1-4 years	4	11%
	5-10 years	10	29%
	More than 10 years	21	60%
Type of MS	Relapsing remitting	14	40%
	Secondary progressive	13	37%
	Primary progressive	5	14%
	Benign	0	0
	Unknown	3	9%

Table 2 Summary of MSIS-29 group information

Group	Mean (+SD) Physical score	Mean Psychological score	Mean Total
1	63 (17)	22 (8)	85(24)
2	59 (17)	25 (8)	84 (22)
3	51(15)[2]	19 (7)	70 (22)
4	78 (31)[1]	30 (8)	108 (16)
5	55 (21)	17 (6)	72 (26)

[1] 1 participant did not complete the physical information within the form and one participant did not provide a score on 2 items.

[2] 3 participants did not provide scores on 1-2 items.

Table 3 Group Priorities - Barriers to Exercise

Group 1	**Priorities**
Lack of information on what I can/should do	1st
Finding a suitable class	2nd
Knowing your limits	3rd
Fear of falling	4th
Need individual support from a person to exercise	5th
Group 2	**Priorities**
Physical limitations/ spasms/muscle stiffness, pins and needles	1st
Pain	2nd
Lack of support from a professional – what exercises to manage/ progress/ regression	3rd
Primary fatigue	4th
Less Time – takes you longer to do things	5th
Group 3	**Priorities**
Fatigue	1st
Need to go to the toilet	2nd
Finances/ cost of attending joining facilities	3rd
Group 4	**Priorities**
Fatigue	1st
How I feel	2nd
Time of day: unable to exercise in the afternoon or morning	3rd
Toilet needs and help	4th
Mental planning is exhausting	5th
Group 5	**Priorities**
Any benefit gained spoiled by fatigue	1st
Balancing how much exercise to do	2nd
Lack of time sometimes	3rd
Tiredness – putting time aside at right time of day/ making time (motivation)	4th
Knowledge of what is “safe” exercise (suitable)	5th

Table 4 Group Priorities -of Solutions to Exercise

Group 1	**Priority**
More specialised gyms for people with MS and specialised support	1st
Advice on what I should try	2nd
Exercising with others with humour and a positive environment	3rd
Safe place	4th
A group of people in a similar situation	4th
Group 2	**Priority**
Mindfulness	1st
Informed support from physiotherapists in hospital and GP surgeries	2nd
Course on self-awareness and confidence building (self-management)	3rd
A cure for MS	4th
To find time/prioritising time	5th
Group 3	**Priority**
Attend rehabilitation centre/attend leisure centre	1st
To have company	2nd
Group 4	**Priority**
Full list of what disabled access there is	1st
A driver to take you there	2nd
Acceptance of disability and ignoring past fitness	3rd
Non stuffy or hot venue	3rd
Public need to be more aware of people in wheelchairs	3rd
Group 5	**Priority**
Possible sessions at gym for less able people (where you are not judged)	1st
Person taking the class needs knowledge (qualified) on exercise for people with MS who are less able	2nd
Better timing/frequency of classes (day rather than evening, spread out over the week)	3rd
Getting a physiotherapists to give you a routine suitable for you	4th
More positive feedback from physiotherapists in terms of expectations	5th

Table 5 Thematic Groupings across NGT Groups – Barriers to Exercise

NGT Group Number	Participant Response *These responses were ranked by 50% of participants within groups. These items were then grouped into themes*	Themes	Ranking	Adjusted Sum	Number Ranking item	% Ranking item
4	Fatigue	**Fatigue**	2,2,3,4,4,4,	17	6	86
3	Fatigue		1,1,1,1,3	23	5	71
2	Primary fatigue		2,3,3,5,	11	4	57
5	Any benefit gained spoiled by fatigue		1,1,1,2,4,	21	5	71
4	How I feel		1,1,2,2,	18	4	57
					Total = 24	**Median=71**
1	Finding a suitable class	**Support and Advice**	2,3,4,4,5,	12	5	71
1	Lack of information on what I can / should do		2,2,2,3,4,	17	5	71
2	Support from a professional - what exercises to do, how to assess progress/regression		1,1,4,5,	13	4	57
1	Need individual support from a person to exercise		1,3,5,	9	3	43
5	Knowledge of what is 'safe' exercise (suitable)		3,4,5,	6	3	43
5	Balancing out how much exercise to do		2,3,3,5,	11	4	57
1	Cost		2,4,5,	7	3	43
					Total = 24	**Median=57**
2	Pain	**Impairments and Symptoms**	4,1,2,3,	14	4	57
2	Physical limitations / spasms, muscle stiffness, pins/needles		3,2,1,3,	15	4	57
3	Need to go to toilet		2,2,2,3,4,	17	5	71
1	Balance limits physical exercise		3,3,5,	7	3	43
1	Fear of falling		1,1,1,	15	3	43
4	Toilet needs and help		1,4,5,	8	3	43
1	Knowing your limits		1,5,5,5,	8	4	57
					Total = 26	**Median=57**
5	Lack of time sometimes	**Time**	3,4,5,5,	7	4	57
2	Time - less time because takes longer to do things		5,2,4	7	3	43
4	Time of the day unable to exercise in the afternoon or morning		1,1,2,	14	3	43
4	Mental planning is exhausting		4,4,5,	5	3	43
5	Tiredness - putting time aside at right time of day/making time (motivation)		1,1,2,	14	3	43
					Total = 16	**Median =43**

Key: **Ranking**: Participants selected five items and ranked these from 1-5, high to lower priority; **Adjusted Sum**: Rankings were re-numbered so that a high score reflected greater strength of agreement. The ranking of 1 became 5, 2 became 4, 3 remained at 3, 4 became 2 and 5 became 1. ; **Number Ranking**: The number of participants choosing this item within NGT groups.; **% Ranking Item**: The percentage of participants choosing this item.

Table 6 Thematic Groupings across NGT Groups - Solutions

NGT Group number	Participants Responses *These responses were ranked by 50% of participants within groups. These items were then grouped into themes*	Theme	Ranking	Adjusted Sum of Ranking	Number Ranking the Item	% Ranking the Item
3	To have company	**Exercise with Similar Others**	2,2,4,	10	3	43
1	A group of people in a similar situation		1,2,3,4,	14	4	57
1	Exercising with others with humour and a positive environment		1,3,4,4,5,	13	5	71
5	Possible sessions at gym for less able people (where you are not judged)		1,3,4,4	12	4	57
1	Group situation preferred		4,4,4,	6	3	43
					Total = 19	**Median = 57**
1	More specialised gyms for people with MS and specialised support	**Specialist Support**	1,1,1,2,2,	23	5	71
2	Informed support from physiotherapists in hospital and GP surgeries		1,2,2,5,	14	4	57
5	Getting a physiotherapist to give you a routine suitable for you		1,2,5,	10	3	43
4	Getting assistance/just the right amount		1,3,	8	2	
5	Person taking the class needs knowledge (qualified) on exercise for people with MS/less able		2,4,4,4,	10	4	57
1	Advice on what I should try		1,1,3,3,3,	19	5	71
5	More positive feedback from physiotherapists in terms of expectations		1,2,5,	10	3	43
3	Attend rehab centre/attend leisure centre		2,2,3,3,3,4,	19	6	86
					Total = 32	**Median =57**
2	Mindfulness	**Attitude of Self and Others**	1,1,2,3,	17	4	57
4	Acceptance of disability and ignoring past fitness		1,4,4,	9	3	43
2	Course on self-awareness and confidence building (self-management)		4,5,5,5,	5	4	57
4	Public need to be more aware of people in wheelchairs		2,2,5,	9	3	43
2	Recognise limitations		3,4,5,	6	3	43
					Total = 17	**Median =43**
4	Full list of what disabled access there is	**Environment and Accessibility**	1,2,4	11	3	43
4	A driver to take you there		2,2,4	10	3	43
1	Safe place		1,1,3,5,	14	4	57
1	Accessible		1,5,5,	7	3	43
4	Non -stuffy or hot venue		1,3,5	9	3	43
					Total = 16	**Median =43**
2	To find time/prioritising time	**Finding Time**	2,2,5,	9	3	43
5	Making exercise routine a priority		2,5,5,	6	3	43
5	Better timing/frequency of classes (day rather than evening, spread out over the week)		1,3,4,	10	3	43
					Total = 9	**Median =43**

Key: **Ranking**: Participants selected five items and ranked these from 1-5, high to lower priority; **Adjusted Sum**: Rankings were re-numbered so that a high score reflected greater strength of agreement. The ranking of 1 became 5, 2 became 4, 3 remained at 3, 4 became 2 and 5 became 1; **Number Ranking**: The number of participants choosing this item within NGT groups; **% Ranking Item**: The percentage of participants choosing this item.